

1 **CLAIMS**

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3       1. A programming interface embodied on one or more computer

4 readable media, comprising:

5           a first group of services related to generating graphical components;

6           a second group of services related to binding properties of a class to a data

7 source; and

8           a third group of services related to formatting content.

9

10       2. A programming interface as recited in claim 1, wherein the first

11 group of services includes a service that determines an appearance of the graphical

12 components.

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14       3. A programming interface as recited in claim 1, wherein the first

15 group of services includes a service that determines a behavior of the graphical

16 components.

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18       4. A programming interface as recited in claim 1, wherein the first

19 group of services includes a service that determines an arrangement of the

20 graphical components.

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22       5. A programming interface as recited in claim 1, wherein the first

23 group of services includes a plurality of nested primitive controls that define the

24 graphical components.

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1           6.    A programming interface as recited in claim 1, wherein the graphical  
2 components are defined by vector graphics.

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4           7.    A programming interface as recited in claim 1, further comprising a  
5 fourth group of services related to animating at least one graphical component.

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7           8.    A programming interface as recited in claim 1, further comprising a  
8 fourth group of services related to creating applications having navigation  
9 capabilities.

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11          9.    A programming interface as recited in claim 1, further comprising a  
12 fourth group of services related to supporting electronic ink processing systems.

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14          10.   A programming interface as recited in claim 1, further comprising a  
15 fourth group of services related to combining a plurality of different media types.

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17          11.   A programming interface as recited in claim 1, further comprising a  
18 fourth group of services related to executing applications on a client using a  
19 browser-type interface.

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21          12.   A programming interface as recited in claim 1, further comprising a  
22 fourth group of services related to automatically installing and executing an  
23 application.

1           **13.**    A programming interface as recited in claim 1, further comprising a  
2 fourth group of services related to serializing content.

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4           **14.**    A programming interface as recited in claim 1, further comprising a  
5 fourth group of services related to automating the generation of a user interface.

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7           **15.**    A software architecture comprising the programming interface as  
8 recited in claim 1.

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10          **16.**    A programming interface embodied on one or more computer  
11 readable media, comprising:

12           a first group of services related to formatting content prior to displaying the  
13 content;

14           a second group of services related to binding properties of a class to a data  
15 source; and

16           a third group of services related to generating imaging effects.

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18          **17.**    A programming interface as recited in claim 16, wherein the first  
19 group of services includes arranging a plurality of data elements.

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21          **18.**    A programming interface as recited in claim 16, wherein the third  
22 group of services includes animating at least one graphical item.

1           **19.**     A programming interface as recited in claim 16, further comprising  
2 a fourth group of services related to creating applications that allow a user of the  
3 application to navigate between a plurality of images.

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5           **20.**     A programming interface as recited in claim 16, further comprising  
6 a fourth group of services related to editing previously created content.

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8           **21.**     A programming interface as recited in claim 16, further comprising  
9 a fourth group of services related to managing input received from an input device.

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11           **22.**     A programming interface as recited in claim 16, further comprising  
12 a fourth group of services related to enabling interoperability with other  
13 computing systems.

1           **23.**     A computer system including one or more microprocessors and one  
2 or more software programs, the one or more software programs utilizing an  
3 application program interface to request services from an operating system, the  
4 application program interface including separate commands to request services  
5 comprising the following groups of services:

6                 a first group of services related to generating graphical objects;

7                 a second group of services related to creating components of the graphical  
8 objects; and

9                 a third group of services related to modifying an appearance of the  
10 graphical objects.

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12           **24.**     A computer system as recited in claim 23, wherein the first group of  
13 services includes a service for defining a behavior of at least one graphical object.

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15           **25.**     A computer system as recited in claim 23, wherein the first group of  
16 services includes a service for defining arrangement of the graphical objects.

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18           **26.**     A computer system as recited in claim 23, wherein modifying an  
19 appearance of the graphical objects includes animating the graphical objects.

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21           **27.**     A computer system as recited in claim 23, wherein the second group  
22 of services includes services to generate geometric shapes.

1           **28.**     A computer system as recited in claim 23, wherein the application  
2 program interface further includes a fourth group of services related to formatting  
3 text.

4  
5           **29.**     A method comprising:  
6           calling one or more first functions to facilitate formatting data;  
7           calling one or more second functions to facilitate creating graphical objects;  
8           and  
9           calling one or more third functions to facilitate changing an appearance of  
10 the graphical objects.

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12           **30.**     A method as recited in claim 29, further including calling one or  
13 more fourth functions to facilitate generating a user interface using a plurality of  
14 graphical objects.

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16           **31.**     A method as recited in claim 29, further including calling one or  
17 more fourth functions to facilitate runtime creation of a user interface.

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19           **32.**     A method as recited in claim 29, further including:  
20           calling one or more fourth functions to facilitate generating a user interface  
21 using a plurality of graphical objects; and  
22           calling one or more fifth functions to facilitate runtime creation of the user  
23 interface.

1           **33.**    A method as recited in claim 29, wherein the first functions  
2 facilitate:

3           receiving user input; and  
4           arranging data elements on a display.  
5

6           **34.**    A method as recited in claim 29, wherein the second functions  
7 facilitate generating geometric shapes.  
8

9           **35.**    A method as recited in claim 29, wherein the second functions  
10 facilitate generating at least one geometric shape and the third functions facilitate  
11 modifying an appearance of the geometric shape.  
12

13           **36.**    A system comprising:  
14           means for exposing a first set of functions that enable creating a plurality of  
15 geometric shapes;  
16           means for exposing a second set of functions that enable changing the  
17 manner in which the geometric shapes are arranged; and  
18           means for exposing a third set of functions that enable modifying  
19 appearances of the geometric shapes.  
20

21           **37.**    A system as recited in claim 36, wherein the second set of functions  
22 further enable arrangement of the geometric shapes on a page to be rendered.  
23  
24  
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1           **38.**    A system as recited in claim 36, wherein the plurality of geometric  
2 shapes include a line.

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4           **39.**    A system as recited in claim 36, wherein the third set of functions  
5 further enable associating imaging effects with at least one geometric shape.

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7           **40.**    A system as recited in claim 36, wherein the third set of functions  
8 further enable changing an appearance of a particular geometric shape over a  
9 period of time.

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11          **41.**    A system as recited in claim 36, further comprising means for  
12 exposing a fourth set of functions that enable generation of a user interface using  
13 the plurality of geometric shapes.

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15          **42.**    A system as recited in claim 36, further comprising means for  
16 exposing a fourth set of functions that enable associating a graphical object with  
17 one or more data sources.

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19          **43.**    A system as recited in claim 36, further comprising means for  
20 exposing a fourth set of functions that enable displaying data-specific versions of  
21 graphical objects.



1           **44.**     A method comprising:  
2           calling one or more first functions to facilitate creating components of  
3 graphical objects;  
4           calling one or more second functions to facilitate generating graphical  
5 objects;  
6           calling one or more third functions to facilitate modifying an appearance of  
7 the graphical objects;  
8           calling one or more fourth functions to facilitate arranging the graphical  
9 objects; and  
10          calling one or more fifth functions to facilitate associating the graphical  
11 objects with data sources.

12  
13          **45.**     A method as recited in claim 44, further comprising calling one or  
14 more sixth functions to facilitate navigating between a plurality of displays of  
15 content.

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17          **46.**     A method as recited in claim 44, wherein the components of the  
18 graphical objects include a plurality of shapes.

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20          **47.**     A method as recited in claim 44, wherein the second functions  
21 further facilitate generating a graphical user interface.

22  
23          **48.**     A method as recited in claim 44, wherein the third functions include  
24 functions that modify the appearance of a particular graphical object.  
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1           **49.**     A method as recited in claim 44, wherein the third functions include  
2 functions that modify the appearance of one or more components of a graphical  
3 object.

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5           **50.**     A method as recited in claim 44, wherein the third functions include  
6 functions that move graphical objects to different positions on a display.

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8           **51.**     A method as recited in claim 44, wherein the third functions modify  
9 an appearance of a graphical object in response to user input.

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11          **52.**     A method as recited in claim 44, wherein the fourth functions  
12 modify an arrangement of graphical objects in response to user input.

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14          **53.**     A method of developing a program, the method comprising:  
15         accessing a first group of functions to select components of a graphical  
16 image;  
17         accessing a second group of functions to generate the graphical image;  
18         accessing a third group of functions to modify an appearance of at least one  
19 component of the graphical image; and  
20         accessing a fourth group of functions to format content associated with the  
21 graphical image.

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23          **54.**     A method as recited in claim 53, wherein the graphical image is a  
24 user interface.

1           **55.**    A method as recited in claim 53, wherein the content is textual  
2 information.

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4           **56.**    A method as recited in claim 53, wherein the content is graphical  
5 data.

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7           **57.**    A method as recited in claim 53, further comprising accessing a fifth  
8 group of functions to associate a component of the graphical image with a data  
9 source.

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11           **58.**    A method as recited in claim 53, wherein the third group of  
12 functions further modify a behavior associated with the at least one component of  
13 the graphical image.